DOCUMENT RESUME

ED 038 664 CG 005 206

AUTHOR Drakeford, Grant C.; Snider, James G.
TITLE Intensity of Meaning Discrimination in Academic Achievers and Under-Achievers.
INSTITUTION American Institutes for Research, Pittsburgh, Pa.; Massachusetts Univ., Amherst.
PUB DATE [70]
NOTE 13p.

EDRS PRICE EDRS Price MF-$0.25 HC Not Available from EDRS.
DESCRIPTORS Able Students, Academic Achievement, *Achievement, *College Students, *Discrimination Learning, Learning, *Perception, *Perception Tests, Student Personnel Services, Underachievers, Verbal Ability, Verbal Learning, Verbal Stimuli

ABSTRACT

The study focuses on the possibility that the tendency of academic underachievers to respond in terms of all inclusive language is indicative of their incapacity to discriminate the uniquely meaningful aspects of their environment. The authors hypothesize that academic achievers would differ significantly from academic underachievers in their capacity to discriminate between verbal stimuli of differing levels of meaningfulness. Also predicted was that such a difference would depend on how the verbal differentiations were arranged and which semantic dimensions were used to measure the discrimination. Subjects consisted of 50 college students divided into two groups matched on sex, class year, and predicted grade point average. The two groups differed significantly in current grade point averages. The subjects were exposed to high and low stimulus words in various treatment conditions so that 27 scores were obtained from each subject. When presented with verbal stimuli of differing levels of meaningfulness, academic achievers discriminated much more finely than did the academic underachievers. The hypothesized tendency was established and implications discussed. Also mentioned were treatment problems. [Not available in hard copy due to marginal legibility of original document.] (Author/MC)

ED038664

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Intensity of Meaning Discrimination in Academic Achievers and Under-achievers

Grant C. Drakeford

(University of Massachusetts)

and

James G. Snider

(American Institutes for Research, Pittsburg)

CG005206

Snider (1966) has found a significant relationship between a preference for all-inclusive conceptualization (that is, the tendency to respond in terms of absolute or overgeneralized language) and a measure of intensity of discrimination of meaningfulness (D4m, Snider, 1967). This finding supports Snider's contention that the individual who overgeneralizes is paying less attention than others to the unique and meaningful qualities of the environment.

The same measures of all-inclusive conceptualization as mentioned above, were employed by Snider and Drakeford (1967) and were found to be capable of distinguishing academic achievers from under-achievers (matched for age, sex, and IQ); the under-achievers being significantly more all-inclusive than the achievers. Following this study, Snider and Drakeford (1968) re-evaluated the all-inclusiveness scales using factor analysis and considered that the variable measured, was better described as "cognitive rigidity;" in that the all-inclusiveness scales loaded highly on a factor defined by many of the currently recognized rigidity scales.

Hence, this relationship between academic achievement and all-inclusive conceptualization might be considered indicative of a tendency towards rigid cognitive style on the part of the under-achievers. Supporting evidence can be found in the work of Davis (1963), who demonstrated that under-achievers... "tend to be rigid and inflexible in their approach to new information and changes in their cognitive field."

The focus of the present study concerns the possibility that this tendency on the part of academic under-achievers to respond in terms of all-inclusive language, that is in a cognitively rigid style is indicative of

their incapacity to discriminate the uniquely meaningful aspects of their environment. Given two stimuli of differing levels of meaningfulness the achiever should display a finer degree of discrimination between the stimuli than should the under-achiever.

There is of course a much wider and more established line of research which emphasize the importance of verbal meaningfulness to learning (Ausubel and Yourself 1963; Ausubel and Fitzgerald 1961, 1962; Ausubel 1963; Campbell and Chapman 1967; Samuels and Jeffrey 1966). However the present study attempts to show that the critical issue of meaningfulness lies not with the stimuli per se but with the subject and his capacity to discriminate between stimuli. For as Campbell and Chapman (1967) have pointed out meaningfulness is not just a property of stimuli but rather it is "determined jointly by the stimuli and what is happening in the learners' head".

The variable "meaning discrimination" is considered as an attribute of the individual. More specifically, the interest in this study is in the ways achievers vs. under-achievers discriminate stimuli which have previously been determined as being of high or low meaningfulness for others. The underlying assumption of this approach being that the individual must live and achieve in an environment dominated by the meanings of others and that a failure to discriminate meaning as do others may be fundamental to under-achievement. To assess this predicted differential response to meaningfulness, verbal stimuli were presented according to the D4m technique outlined by Snider (1967). This method untilizes certain qualities of Nobles m scale (Noble 1952) and Osgood's D4 measure (Osgood, Suci and Tannenbaum 1957) and maybe considered a measure of intensity of discrimination of relative levels of meaningfulness. $D4_m = \Sigma D4\ H_m - \Sigma D4L_n$, where $D4\ H_m$ and $D4\ L_m$ are the

D4 Evaluation, Potency, and Activity dimension coordinates for stimuli of high and low m. Thus, essentially D4m is a different score and was calculated separately for each of the three above dimensions.

The general hypothesis of the study was that academic achievers would differ significantly from academic under-achievers in their capacity to discriminate between verbal stimuli of differing levels of meaningfulness. Further, it was predicted that such a difference would depend on how the verbal stimuli differentiations were arranged (High-High, High-Low, and Low-Low) and which semantic dimensions (Evaluation, Activity, Potency) were used to measure the discrimination.

Method

Subjects: The S's consisted of 50 students enrolled in Psychology 301 at the University of Massachusetts. These S's were chosen so as to comprise two groups of 25 S's, each matched on sex, class year, and predicted grade point average (P.G.P.A.) (The P.G.P.A. is based on a regression equation used by the University of Massachusetts Admissions Office and utilizes both High School rank and College Board Examination scores.) The groups differed significantly ($p < .05$) in current grade point average (GPA) such that the mean of the achievers was plus 0.80 grade points above their P.G.P.A. while the mean of the under-achievers was minus 0.34 grade points below their P.G.P.A. All achievers had G.P.A.'s above their P.G.P.A.'s while all under-achievers had GPA's below their P.G.P.A.'s.

Procedure: The test material consisted of a booklet, on the pages of which appeared high m stimulus words (Kitchen, Dinner, Army, Wagon, Money, Office) and low m stimulus words (Gojey, Byssus, Neglan, Balap, Meardon,

Volvap) One stimulus word appeared on each page and below it were the nine Semantic Differential Scales each quantifying one of the three meaning dimensions. The order of presentation of the stimulus words was randomized to control for sequence effects. The testing was carried out following the regular class lecture and during course laboratory sessions.

From the high and low m stimulus words the various treatment conditions were arranged such that 27 scores were initially obtained for each S. These scores were made up of different score for each dimension of meaning (Evaluative, Potency, Activity) under each treatment combination (High-High, High-Low, Low-Low). This 3 x 3 format was repeated 3 times in each booklet using different stimulus words chosen at random but maintaining the treatment combinations for each trial. For the purpose of analysis the scores were summed over trials within dimension x treatment blocks. A trial x achievement effect was considered extremely unlikely. This yielded 3 x3 scores per subject which was then subjected to an analysis of variance. The design was "mixed" (Myers, 1966. P. 202) and involved one between (achievement) and two within subjects (treatment, dimension) variables.

Results: A summary of the analysis of variance can be seen in Table I. From this table it is apparent that the basic hypothesis of the study has been upheld. There is a highly significant ($p<.001$) main effect of achievement which indicates that, averaging over treatments and dimensions, achievers are more discriminating than under-achievers,

TABLE I

Analysis of Variance

S.V.	d.f.	F
A (achievement)	1	28.50*
S/A	48	
T (treatment)	2	37.41*
AT	2	8.75*
ST/A	96	
D (dimension)	2	1.24
AD	2	.42
SD/A	96	
TD	4	1.57
ATD	4	1.92
STD/A	192	

* $p < 0.001$

the direction of the difference being indicated in table II.

TABLE II

All Means Averaged Over Dimensions

	HiHi TREATMENT	HiLo TREATMENT	LoLo TREATMENT
UN.ACH	5.28	6.65	3.76
ACH	6.70	11.85	3.84

Table I also shows a highly significant main effect of treatment, and a similarly significant achievement x treatment interaction. This

result supports the notion that the differences in stimuli discrimination will vary as a function of the particular treatment level considered. The nonsignificant effects of dimension indicate that the above achievement and treatment differences are not dependent upon measurement along a particular semantic differential dimension of meaning. This latter finding, while negative in terms of the initial hypothesis of the study is important because it adds considerably to the generalizability and practical usefulness of the D4m technique for meaning measurement. Such a finding should make future specific dimensional analysis unnecessary.

While the means in Table II appear to be directionally in support of the general hypothesis of the study, 't' tests were performed to establish the significance of the apparent differences. This procedure produced some interesting results. Firstly, the under-achievers not only seemed to discriminate less within a treatment condition, but they also discriminated poorly between treatment conditions when compared to the achievers. That is, significant differences between treatment means were found only between the HiLo and LoLo condition ($p<0.05$) in the under-achieving group while all possible orthogonal (a-1) comparisons yielded significant differences in the achieving group. This means that only when a high m word is compared to a low m word is the resultant discrimination significantly different from when a low m word is compared to another low m word in the under-achieving group; while in the achieving group significantly different discriminations were made with each treatment combination.

The second interesting finding of the 't' test analysis is that when the simple effects of achievement are considered, only under the HiLo

treatment condition is the difference significant ($p < 0.01$). In other words, neither group discriminates significantly more under the Lo-Lo condition and under the HiHi condition. However, it should be remembered that the achievers did discriminate significantly ($p < 0.01$) less in the HiHi than in the HiLo while the under-achievers discriminated in a basically similar fashion under both treatments.

Summarizing the comparison of the means it would seem that both the achievers and the under-achievers considered the LoLo condition stimuli as essentially meaningless. Under the HiLo condition both groups discriminated significantly more than they had under the LoLo condition, but the achievers discrimination was much more pronounced under the HiLo condition and significantly higher than the under-achievers under the same condition. Under the HiHi condition both groups discriminated less than under the HiLo condition but only in the achieving group was this difference significant. The overall results would seem to indicate that when presented with verbal stimuli of differing levels of meaningfulness academic achievers discriminate much more finely between these stimuli than do academic under-achievers.

Discussion: What then are the implications of these results toward a theory of under-achievement? It would seem both from the results of the present study, in which groups differing in academic achievement have been shown to differ significantly in their capacity to discriminate between environmental stimuli, and from the Snider and Drakeford (1967) study in which groups differing in academic achievement were found to differ significantly on a cognitive rigidity variable; that rigidity and flexibility of cog-

nitive style should constitute a critical component in any theory of under-achievement. The relevance of the findings of the present study being that the under-achievers would seem to discriminate less well than the achievers on differing verbal stimuli and to be responding in a similar and hence rigid, style.

It is not difficult to imagine how poor meaning discrimination could negatively affect learning, there being, of course, a considerable accumulation of data on the role of discrimination of stimuli and responses in, and for, a theory of learning. However, generally, meaning discrimination as a variable is examined and controlled for in the stimulus dimension, it being assumed that if generally meaningful v's meaningless stimuli are presented, proper control of this variable will have been ensured. However, we have noted that various groups do not respond <u>properly</u> to the above controls and if we can assume that present theory, research and practice is presenting learning materials in <u>generally</u> meaningful ways the problem must lie, at least in part, with the student rather than with the stimuli. Such a group might well be academic under-achievers who seem, as usually defined, in spite of adequate intellect and proper learning conditions unable to learn in meaningful ways. Such an observation is not unique, for as Shaw & Grubb (1958) point out "under-achievement among bright students is not a problem which has its genesis within the educational framework, but rather one which the under-achiever brings with him, at least in embryo form, when he enters high school."

The response to meaning (or lack of it) in the under-achiever is probably cyclical. Once a general lack of discrimination of meaning begins, we might assume that such a response would interfere with and limit further

learning to discriminate meaning. Such a beginning might arise from a variety of sources, for example, the double-bind situation from which a cycle may begin which could make the individual less and less responsive to changes, nuances, and general "agreed-upon-differences" in the meaning of stimuli. That is, such a pattern might well set the stage for the development of the more pervasive notion of the under-achiever's rigid cognitive style. However we might well note here, that the relationship of rigid cognitive style to poor meaning discrimination still has, at this time all the trappings of the proverbial "chicken and egg" problem.

However, educational intervention is not necessarily dependent upon a resolution to this problem. If the above implications of this study are warranted then there are some specific types of remedial experiences which might be beneficial to the under-achiever, for instance, sensitivity training, T groups and even general counseling, but in each case, practiced with special attention to the meaning dimension. Also suggested would be attention to the difficulties of the individual under-achiever in discriminating the differential meanings of school subjects and the social environment which he lives. It is suggested, however, that manipulation of environmental factors such as curriculum changes, to get closer to the interests of the individual and changes in teaching methods might have some impact but at a shallow level and for a temporary period. What is essential is to provide an environment, for instance a peer group situation, in which the under-achiever can receive massive reinforcement for meaning discrimination responses. Many of the general aims and objectives of T-group and sensitivity training are relevant to the under-achievers apparent need for re-education

of meaning discrimination.

Conclusion: The hypothesized tendency to be less discriminative of meaningfulness on the part of under-achievers was established and the implications of this finding for a theory of under-achievement discussed. Treatment programs were mentioned and it was concluded that the major problem would seem to be to increase the under-achievers sensitivity to subtle differences in environmental stimuli. Which specific approach is used may not make as much difference as the fact of paying attention to the problem.

REFERENCES

1. AUSUBEL, D. P. The Psychology of Meaningful Verbal Learning. New York Greene and Stratton, 1963.

2. AUSUBEL, D. P. and FITZGERALD, D. The role of discriminability in meaningful verbal learning and retention. J. Educ. Psychol. 1961, 52, 266-274.

3. AUSUBEL, D. P. and FITZGERALD, D. Organizer, general background and antecedent variables in sequential verbal learning. J. Educ. Psychol. 1962, 53, 243-249.

4. AUSUBEL, D. P. and YOURSELF, M. Role of discriminability in meaningful parallel learning. J. Educ. Psychol. 1963, 54, 331-336.

5. CAMPBELL, V. N. and CHAPMAN, M. A. Learner control v's program control of instruction. Psychol. in Schools 1967, 4, 121-130.

6. DAVIS, A. Cognitive rigidity and intolerance of ambiguity in future scientists and in under-achieving high school students. Unpublished paper presented at meeting of the California State Psychological Association San Francisco, December, 1963.

7. MYERS, J. L. Fundamentals of Experimental Design Allyn & Bacon, Boston, 1966.

8. NOBLE, C.E. An analysis of meaning. Psychol. Rev., 1952, 59, 421-430.

9. OSGOOD, C. E., SUCI, G. J. and TANNENBAUM, P. H. The measurement of meaning. Urbana: University of Illinois, 1957.

10. SAMUELS, S. J. and JEFFREY, W. E. Discriminability of words and letter cues used in learning to read. J. Educ. Psychol., 1966, 57, 337-340.

11. SNIDER, J. G. All-inclusive conceptualization and intensity of meaningfulness: Research note. Alberta J. Educ. Res., 1966, 12, 281-284.

12. SNIDER, J. G. The D4m measure. Psychol. Reports, 1967, 21, 843-844.

13. SNIDER, J. G. and DRAKEFORD, G. C. All-inclusive conceptualization in academic achievers and under-achievers. Psychol. Schools, 1967, 4, 172-173.

14. SNIDER, J. G. and DRAKEFORD, G. C. Two scales to measure cognitive rigidity. J. Psychol. 1968, 68, 223-226.